PANAMINT ALLIGATOR LIZARD
Elgaria panamintina

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Management Status: Federal: USFWS Species of Concern; BLM Sensitive
California: Species of Special Concern (CDFG, 1998)

General Distribution:

The Panamint Alligator Lizard (*Elgaria panamintina*) is endemic to California, where it is known only from 16 disjunct localities in the Panamint Mountains (Brewery and Limekiln Springs, Surprise Canyon, Pleasant Canyon), Nelson Mountains (Grapevine Canyon), Inyo Mountains (Daisy Canyon, Lime Hill), and White Mountains (Batchelder Spring, Marble Canyon, Tollhouse Spring, Westgard Pass) of Inyo County, California. Sight records (12) have been reported for the eastern Argus, Cosos, Panamint, Inyo, and White Mountains of Inyo and southeastern Mono counties, California (Stebbins, 1985; Macey, 1986; Papenfuss, 1986; Macey and Papenfuss, 1991; Jennings and Hayes, 1994; La Berteaux and Garlinger, 1998). The species may also occur in Benton and Queen valleys and in mountains of western Nevada (Banta, 1965; Macey and Papenfuss, 1991). The elevational range of the species extends from 2500-7500 ft (760-2290 m).

Distribution in the West Mojave Planning Area:

In the WMPA this species is known only from sight records from several valleys in the eastern Argus Mountains.

Natural History:

The Panamint Alligator Lizard is a large lizard (SVL 150 mm [6 in]) with a tail nearly twice its body length. It is distinguished from all other congeners by having 10 (rarely 12) keeled longitudinal dorsal scale rows, 44-47 (x=45.7) transverse dorsal scale rows, and the presence of 7 or 8 complete, well defined, brown to dark-brown crossbands on the body, exclusive of the tail. The ventral surface is white with gray spots at the center or edges of the scales forming irregular scattered blotches. There are 6 rows of weakly keeled scales on the tail (counted on the first whorl from the base of the tail that contains 20 scales). The iris of the eye is pale yellow. Young possess black crossbands on the body and tail and interspaces of pale orange-yellow, fading to white laterally. Both sexes are similar in color and pattern; as adults, males have a broader, more triangular head then female's (Stebbins, 1958, 1985).

Comprehensive studies and field data on the natural history of the Panamint Alligator Lizard are lacking. Various aspects of the natural history are based on incidental field observations (see Jennings and Hayes, 1994 and Banta et al., 1996) and infrequent monitoring of pitfall traps (Banta, 1962, 1963). Museum and literature records based on 24 specimens indicates that the species is active from April-October. Peak activity periods are in June with a decrease in activity and aestivation occurring during the months of July and August (Banta, 1963). Although typically active during the day, Panamint Alligator Lizards are nocturnal during the hot summer

months (Dixon, 1975). There seems to be a preference for relatively low air temperatures (15-24 C; Stebbins, 1958). Long (1972) recorded body temperature (23 C) and air temperature (23.5 C) from one individual observed in the field.

The Panamint Alligator Lizard spends much of its time foraging in thick brush and along talus slopes. It is rarely encountered in the field, but is occasionally observed basking on rocks in open areas, near thick vegetation (e.g., wild grape; Stebbins, 1973; Long in litt., 1972). The diet of the Panamint Alligator Lizard is unknown, although mealworms have been eaten in captivity (Stebbins, 1958; Banta and Leviton, 1961; Banta, 1963).

An adult female captured on 1 May 1959 contained 12 eggs (2.4-4.4 mm in diameter; Banta, 1963). Mating of two individuals in captivity was observed from 15-17 May (Banta and Leviton, 1961). In addition, data relevant to the Southern Alligator Lizard (*E. multicarinata*) suggests that Panamint Alligator Lizards may produce a second clutch in late summer (see Burrage, 1965).

Although there are no records of predation on the Panamint Alligator Lizard, it may be a prey item of the following vertebrate species: Coachwhip (*Masticophis flagellum*), Striped Whipsnake (*M. taeniatus*), Western Patch-Nosed Snake (*Salvadora hexalepis*), California Kingsnake (*Lampropeltus getula*), Long-Nosed Snake (*Rhinocheilus lecontei*), Red-Tailed Hawk (*Buteo jamaicensis*), Greater Roadrunner (*Geococcyx californianus*), Loggerhead Shrike (*Lanius ludovicianus*), and Coyote (*Canis latrans*; Marlow, 1988; Jennings and Hayes, 1994).

Habitat Requirements:

The Panamint Alligator Lizard probably had a greater distribution in the mesic Pluvial period of the Pleistocene (Good, 1988). Following the Pluvial retreat, accompanied by increased aridity and the formation of desert environments, it survived as a relict to occupy mesic canyons of the Inyo, Panamint, and White mountain ranges (Banta, 1963). The species occurs most frequently in canyons supporting riparian habitat and nearby permanent springs. It is less abundant in xeric habitats associated with rocky alluvium and boulder talus slopes. This riparian habitat is dominated by Red Willow (*Salix laevigata*), Arroyo Willow (*S. lasiolepis*), Virgin's Bower (*Clematis ligusticifolia*), Wild Grape (*Vitis girdiana*), Scarlet Monkey Flower (*Mimulus cardinalis*), and Southern Maidenhair Fern (*Adiantum capillus-veneris*). Decaying willows, branches, and layers of leaves (over a foot thick) cover the riparian floor. Bordering the riparian are rocky talus slopes and boulder strewn hillsides dominated by xeric adapted plant species such as Creosote Bush (*Larrea tridentata*), Wormwood (*Artemisia ludoviciana*), Shad Scale (*Atriplex canescens*), California Buckwheat (*Eriogonum fasciculatum*), Acton's Encelia (*Encelia virginensis*), Beavertail Cactus (*Opuntia basilaris*), and Barrel Cactus (*Ferocactus acanthodes*) (see Stebbins, 1958 and Banta, 1963). Specimens collected in the dry washes and along talus slopes of Grapevine and Daisy canyons, indicate that the species may occur over a wider geographic range within the Owens, Panamint, and Saline valley hydrographic basins (Banta et al., 1996).

Population Status:

No data on population status and relative density of the Panamint Alligator Lizard are available.

Threats Analysis:

A potential decline in Panamint Alligator Lizard populations may be attributed to the direct loss of riparian habitat. Although there are no baseline data that suggests a current decline in population numbers, habitat loss or alteration due to expanded mining operations, off-highway vehicle (OHV) activity, grazing (domestic and feral), and introduction of non-native invasive plant species (e.g., Tamarisk) could have serious adverse effects in riparian areas where this species occurs. Over collecting, which could also contribute to the species decline, is a secondary consideration. Direct threats to populations are the result of human activities and will likely increase in the future.

Of concern, are proposed mining operations and their impact on the mortality of Panamint Alligator Lizards. Construction or improvement of access roads in concert with increased vehicular traffic through or adjacent to "islands" of riparian habitat could threaten lizard populations. Proposed mining operations that alter or modify springs, seeps, and stream flow would be a direct threat to the hydrology within the species habitat.

The hydrophilic plant, Salt Cedar (*Tamarix ramosissima*), is a non-native invasive species that has naturalized along the western slopes of the White-Inyo Range (up to 6000 ft [1829 m]). Tamarisk has also become widespread in mesic desert habitat and is a serious threat to springs and seeps in the region (DeDecker, 1991).

Off-highway vehicle activity has increased significantly over the last 15 years and many OHV enthusiasts have resorted to wenching up steep canyon walls and washes to explore the Panamint Mountains. On a visit to the species' habitat in Surprise and Pleasant Canyons on 13-14 April 1996, extensive dirt bike activity and several high use trails (i.e., wenching) were observed (pers. obs.).

Illegal collecting using pitfall traps and coverboards may also threaten populations.

All localities where the Panamint Alligator Lizard is known to occur are restricted use areas with limited access and, with the exception of State Highway 168 in the vicinity of Cedar Flats and Westgard Pass (Dixon, 1975), threats related to highway mortality and urban development are negligible.

Biological Standards:

It is critical that management efforts be directed at protecting habitats associated with all known Panamint Alligator Lizard localities. Specifically, impacts on hydrology should be avoided to ensure the long-term viability of populations. Off-highway vehicle activity and proposed mining operations are serious threats to core population centers. Protection of this species for future field studies can be achieved through land use restriction efforts. A well supervised, repetitive pitfall monitoring program could provide baseline data that would aid in our understanding of the distribution, habitat requirements, and populations status of the Panamint Alligator Lizard. Until additional distribution and population data become available, a management plan or recommendations for long-term population viability is inconclusive.

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